# E. Hardware: questions to labs / community groups:

# *(please type responses below)*

*General*

1. Do you currently work with plants/algae and, if not, is this an area of research you would be interested in?

We do work with plants. Mostly Arabidopsis but occasionally we have a project that uses some other species but we’ve never done any transformations on anything but Arabidopsis.

1. What do you see as the major obstacles in working with plants/algae?

Assuming you’re talking about doing genetic transformation, biggest problems are (1) dealing with Agro is a pain in the ass (2) gene guns are either really expensive or really dangerous. But handling plants in general is pretty simple.

1. What equipment do you currently use for culturing your cells?

Usually solid MS media with whatever hormones are needed.

1. What features would you find useful in a new incubator?

No comment. I’ve never used any specialized plant tissue incubator.

1. Could you give a rough estimate of the budget your lab has for new instruments?

Close to nothing. Everything we get is either free or close to free. If there was a piece of equipment that we really needed and couldn’t find a free option, we may spend like 100 or so dollars on it.

*Transformations*

1. Does your lab / community group currently use transformation protocols? Which ones?

Agro floral dip.

1. Have you used biolistics before?

Yes, although not in our community lab. I used a commercial gene gun at a university.

1. Does your lab / community group have access to a gene gun? If not, is this something your lab would be able to purchase in the future?

We don’t have one. If it was cheap enough we might be interested.

*DIY*

1. What level of technical experience do members of your lab currently have?

e.g. in electronics/wiring, wood work, laser cutting, general DIY

Wide variety. Some people can do electronics, some people can do woodwork, a couple of folks do 3D printing. If we needed to build something we could find people to get the job done.

1. Have you built any open source hardware before? If so, did you encounter any difficulties?

Yes. Usually the problems are due to insufficient documentation. Specific problems would be links becoming broken over time, open source software being updated and not working the way it worked when first documented. Firmware written for one chip but not working because only a newer version of the chip is available. Also, I frequently encounter projects that depend on some PCB or power supply that isn’t for sale anymore.

1. Are you interested in building your own open source hardware, or finding out more about DIY biology hardware?

Yes. And we do frequently.

1. We are designing a low cost open source growth box and gene gun - roughly what budget would your lab be able to allocate to building one of these devices, if they could be used in place of higher cost commercially-available equipment?

Maybe 200 USD if there were enough people willing to chip in.

*Our protocols*

1. Would you be interested in receiving protocols for our hardware and possibly building it for your lab / community group?

Yes.

1. Do you have any comments on the specifications above?

Looks pretty reasonable. I would need more details to really evaluate the safety. But I like that it operates at a lower pressure than all other gene guns I have seen. Assuming it works just as well as other designs, I’m excited.

1. Do you have any recommendation as to how we can improve our hardware’s safety?

No comment. I’m not really knowledgeable enough to make good suggestions. I just know I get scared when I see someone cobble together some pipes from the hardware store and pressurize it to 1000psi :)